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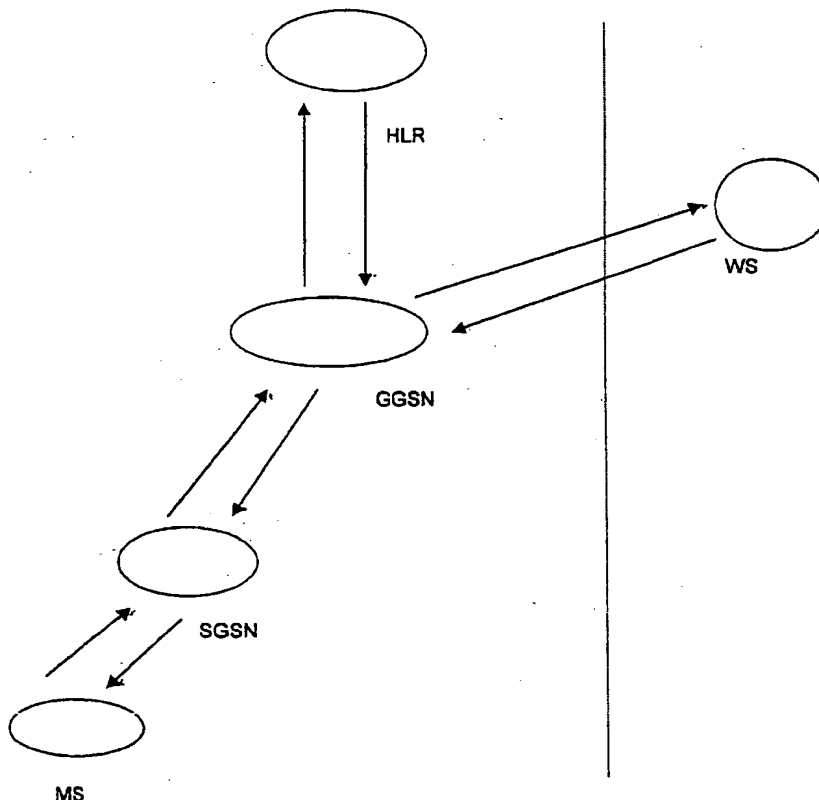
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(54) Title: METHOD FOR INITIATION OF A COMMUNICATION SESSION IN A MOBILE TELEPHONY NETWORK



(57) Abstract: The invention relates to a method for use in a mobile telephony packet data network in which a subscriber has been assigned a user address within the network. The method allows a service provider who is external with regard to the network to receive information about the user's address and thereby to communicate with the subscriber, in that the method comprises the use of an Internet access protocol to allow an external service provider to initiate a set-up procedure for the subscriber within the network. According to the invention, the external service provider preferably uses information about the subscriber known to the provider in initiating the set-up procedure.

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wishing to transfer information to the subscriber, will thus not know which IP-address the user has been assigned at that particular point in time, and will accordingly not be able to reach him.

- 5 In addition, a situation might exist in a system with dynamic assignment of IP-addresses in which the subscriber hasn't even initiated a session with the data network, i.e. he has only performed the so called "attach" procedure, not the "session set-up procedure." In this case, the subscriber hasn't been assigned a dynamic IP-address, thus also making it impossible for an
10 external provider to reach him via the Internet/Intranet.

SUMMARY

- There is thus a need for a method by means of which a provider who is external with regards to a mobile telephony packet data network can reach a
15 subscriber in the network without prior knowledge of that subscriber's address in the network. The method should be cost effective and simple to install in existing systems, and should in particular be able to address the case of subscribers being assigned their addresses in the network in a dynamic fashion, in which cases the external provider should be able to
20 receive information about the user's dynamic address.

In addition, the method should also enable external providers to transfer data to users who have not at that particular point in time been assigned an IP-address, i.e. "attach" has been performed, but not "session set-up".

25

- Such a method is provided by the present invention in that it comprises the use of an Internet access protocol to allow an external service provider to trigger a set-up procedure for the subscriber within the network. By means of the invention, it is thus possible for an external service provider to trigger a
30 procedure which it would normally only have been possible for the subscriber himself to initiate. The procedure will lead to an IP-address being assigned to the subscriber, and information about the IP-address will be sent to the

external service provider who will then be able to reach the subscriber and transfer information to him.

In a particular embodiment of the invention, the external service provider
5 uses information about the subscriber, which is already known to the provider in triggering the set-up procedure.

DESCRIPTION OF THE DRAWINGS

The invention will be described in more detail below, with the aid of the
10 appended drawings, in which
Fig 1 shows a schematic overview of a system in which the invention can be applied.

EMBODIMENTS

15 Fig 1 shows a schematic overview of a mobile telephony packet data system in which the invention can be applied. The following system components are shown in the figure:

HLR - Home Location Register.

GGSN - Gateway GPRS Support Node.

20 SGSN - Serving GPRS Support Node.

MS - Mobile Station, i.e. the terminal or telephone as such.

MSC - Mobile Switching Center.

In addition, the following abbreviations will also be used in the text:

25 DHCP - Dynamic Host Configuration Protocol

DNS - Domain Name Server

MSISDN - Mobile Station Integrated Services Digital Network

RADIUS - Remote Authentication Dial In User Service

30 In addition to the system components, an external web server (WS) is also shown, symbolically separated from the system as such by dashed lines. This external web server is preferably an Internet or Intranet server, used by

a service provider with whom the subscriber (MS) has an agreement or a subscription for the transfer of certain information.

5 In order for the web server to send information to the subscriber (MS), the web server needs to know the so called IP-address (IP, Internet Protocol) of the subscriber. This IP-address can in some systems be assigned to the subscriber once and for all, when the subscriber first starts to use the system, so called static assignment of IP-addresses. However, in other systems, IP-addresses are assigned in a so called dynamic fashion, i.e. an IP-address is
10 assigned to a user only for the duration of an ongoing so called session. In this case, it becomes impossible for the external web server to address information to a particular subscriber, since the external web server has no way of knowing the IP-address of the subscriber. Three different cases can be seen here:

15

1) The subscriber is using his MS, but not for the transfer of data via e.g. the Internet or an Intranet. In this case, the subscriber is "attached" to the network, but no IP-address has been assigned to him. This subscriber has only performed what is known as an "attach" procedure, giving him access to
20 the network, the session set up procedure which assigns an IP-address has not yet been performed.

2) The subscriber has performed both "attach" and "set-up", and has thus been assigned a dynamic IP-address, but as explained above, this IP-
25 address is still unknown to the external web server which for that reason cannot transfer information to the subscriber.

3) The subscriber has a static IP address assigned for their exclusive use.

30 In order for the web server to be able to transfer information to the subscriber in either of the situations outlined above, i.e. static/dynamic allocation of IP-addresses, the invention provides a component in the mobile telephony

network, preferably the GGSN, with the functionality of an Internet access protocol. There is no need for the entire Internet access protocol to be emulated by the network component or node, a simplified version can be used which carries out the operations which will be described in the following.

- 5 This simplified version of the Internet access protocol need only allow the external web server the possibility of interfacing with the mobile network according to that particular protocol, the node or nodes in the network in which the Internet access protocol is located doesn't need to implement all of the functions of the protocol.

10

According to the method of the invention, a possible sequence of events is as follows:

1. The external web server informs the network, preferably via the GGSN,
15 that it wants to transfer information to a subscriber. This can be done by a number of different Internet access protocols, such as for example the DNS protocol, but other protocols which could also be used are the RADIUS, DHCP or the DIAMETER protocols. To this end, the GGSN is provided with the functionality of the Internet access protocol which is used, which means
20 that the web server can address the mobile subscriber using protocols it would use to address any other Internet/Intranet-subscriber. The external web server does not know the IP-address of the subscriber, nor does it even know if he has one, for which reason the subscriber must be identified to the GGSN by the web server in some other way. For this purpose, the web
25 server has some information other than an IP-address regarding the subscriber stored, for example the subscriber's MSISDN.

30

2. The GGSN addresses the HLR, and is in return informed of which SGSN is the most suitable for addressing the MS.

3. The GGSN addresses the SGSN in question, which in turn addresses the MS.

4. The MS initiates a so called "session set-up".
5. As a result of the "session set-up", the MS is assigned an IP-address, or in the case of a user with a static IP-address, the network can obtain the IP-address. Alternatively, if the IP-address is known to the network prior to the setup, it can be returned to the WS at the same time as it is provided to the MS, or before it is provided to the MS.
- 10 6. The IP-address is returned to the WS via the Internet access protocol.

In a further embodiment of the invention, the Internet access protocol used could contain functions for accounting and authorization towards the external web server. Authorization would mean that only certain web servers, for example web servers which have contracts with the operator of the network, would be allowed to access the network in the fashion shown above, other web servers would simply be refused access to the subscribers in the network. Accounting could be used to bill those external web servers which access the network in the fashion shown above.

20 The invention is not limited to the embodiments shown above, but may be freely varied within the scope of the claims. For example, the Internet access protocol used could in principle be any suitable Internet access protocol, and the information about the subscriber which the external web server uses to identify the subscriber to the system could be an arbitrary piece of information, as long as it identifies the subscriber to the network in a sufficient manner. In addition, the invention may be applied both to wireless mobile telephony packet data network and to systems which use traditional wirelines.

2001-10-16

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CLAIMS

1. A method for use in a mobile telephony packet data network in which a subscriber has been assigned an IP-address within the network, said method
5 allowing a service provider who is external with regard to the network to receive information about the user's an IP-address, and thereby to communicate with the subscriber, said method being characterized in that it comprises the use of an Internet access protocol to allow an external service provider to initiate a set-up procedure for the subscriber within the network.
10
2. A method according to claim 1, applied in a wireless mobile telephony packet data network.
3. A method according to claim 1 or 2, in which the user's IP-address is
15 assigned in a dynamic fashion.
4. A method according to claim 1 or 2, in which the user's IP-address is assigned in a static fashion.
- 20 5. A method according to any of claims 1-4, in which the Internet access protocol used is the DNS-protocol.
6. A method according to any of claims 1-4, in which the Internet access protocol used is the RADIUS-protocol.
25
7. A method according to any of claims 1-4, in which the Internet access protocol used is the DHCP-protocol.
8. A method according to any of claims 1-4, in which the Internet access
30 protocol used is the DIAMETER-protocol.

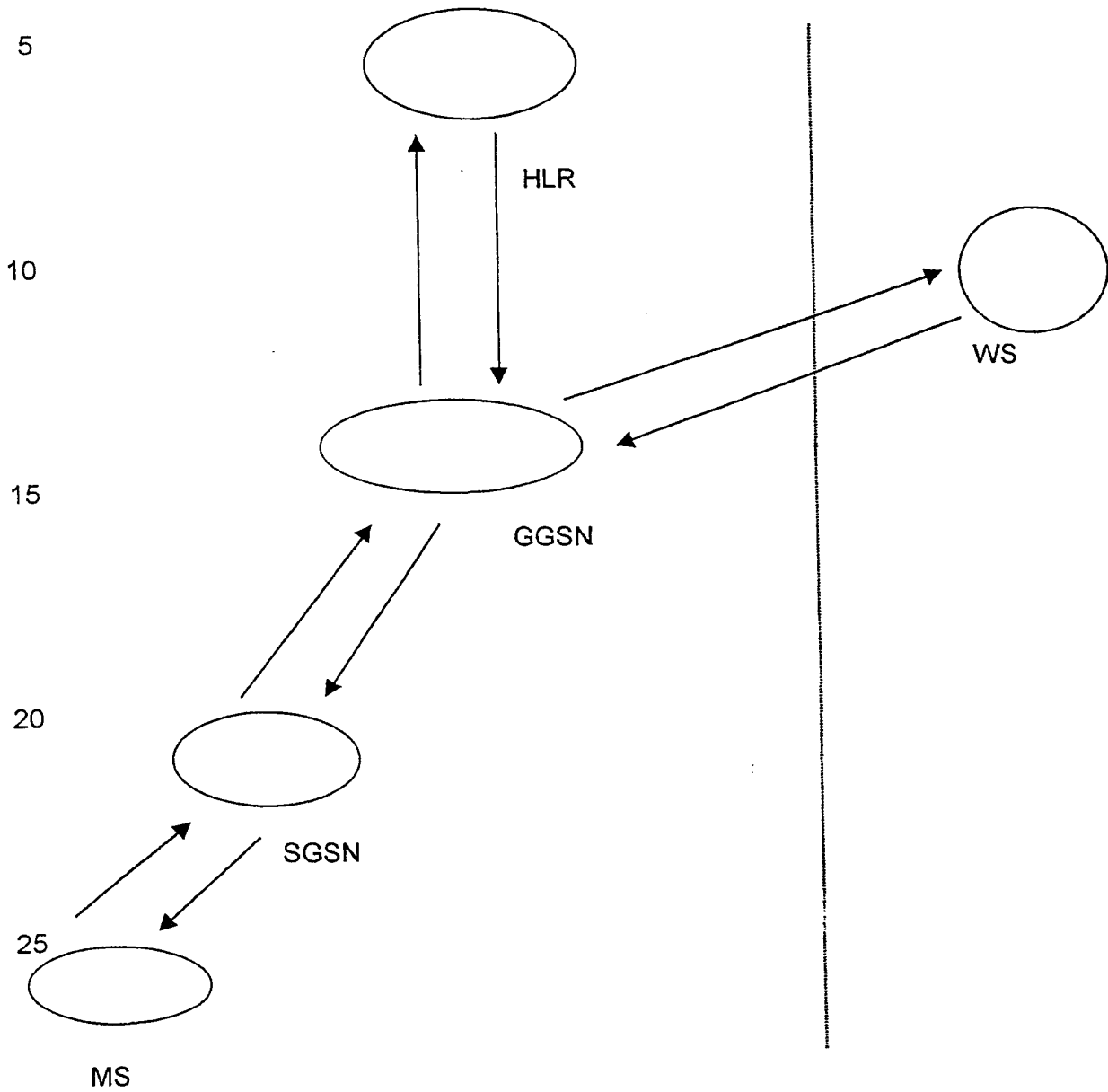


Fig 1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 01/02278

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04L 12/56, H04Q 7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI DATA, EPO-INTERNAL, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	EP 1065870 A2 (LUCENT TECHNOLOGIES INC), 3 January 2001 (03.01.01), column 4, line 8 - line 39; column 8, line 24 - line 34; column 8, line 41 - line 49, column 9, line 16 - 35; figure 3A,3B,4,5A --	1-8
X	EP 1028569 A2 (CELESTICA LTD), 16 August 2000 (16.08.00), column 7, line 42 - line 58; column 8, line 7 - line 55, figures 2A,2B,2C --	1-8
A	WO 0044148 A1 (3COM CORPORATION), 27 July 2000 (27.07.00), page 2, line 28 - line 31; page 3, line 1 - line 30; page 4, line 9 - line 21, figures 1A,1B -- -----	1-8

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"E" document member of the same patent family

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Patent document cited in search report			Publication date	Patent family member(s)		Publication date
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EP	1028569	A2	16/08/00	AU	5874099 A	03/04/00
				EP	1116008 A	18/07/01
				GB	2350520 A	29/11/00
				GB	9903028 D	00/00/00
				NO	20011230 A	11/05/01
WO	0044148	A1	27/07/00	AU	3104900 A	07/08/00